Appendix C

United Space Alliance

POST Tools

Use Case Specification: CDT-07B Generate Product – XML/RTF
Version 2.0

Revision History

Date	Version	Description	Author
	1.0	Initial Release	CDT Team
	2.0	Add Annex 4 Table Report Generation	CDT Team

Table of Contents

Use Case Specification: CDT-07B

1. Business context

This use case allows the actor (Payload Customer and/or Payload Field Engineer) to generate payload Extended Markup Language (XML) and Rich Text Format (RTF) products. The specific products to be generated are identified in the Payload Operations Support Team (POST) Command and Data Tool (CDT) Product Interface Definition Document (IDD) [4].

Product File	Product Type	Sources
Payload Definition	XML	Payload Definition
	XML	Payload Application Definition
Parameter Definition	XML	Basic Parameter Definition
	XML	Calibration
	XML	Command
	XML	Command Data Word
	XML	Downlist
	XML	FDA
	XML	FDA Preconditioning
	XML	MDM Channelization
	XML	MRTC
	XML	Payload Definition
PDI Loading	XML	Basic Parameter Definition
	XML	Payload Definition
	XML	Telemetry Parameter Location Definition
Payload Data Stream Structure	XML	Payload Definition
	XML	Payload Data Stream Structure
	XML	Decom Words Downlink
PSP SSI File	XML	Payload Definition
	XML	Payload Signal Processing (PSP) Messages
	XML	Standard Serial I/O (SSI) Definition
Standard Orbiter Parameters	XML	Standard Orbiter Parameters
Hazardous Command Structures	XML	Hazardous Command Structures
Parameter Validation	XML	Basic Parameter Definition
	XML	Standard Orbiter Parameters
Annex 4 Tables	RTF	See details below . . .
GPCF Payload Application	XML	Subset of the above for each Payload Application. [4]

These products will provide a complete set of payload command and telemetry data for external systems. These include, but not confined to PIT, Cargo PC, and POST SMS Model Tool.

The source for these products identified as data categories are listed below. The data elements associated with the data groups are in the POST Command and Data Tool Data Dictionary [3]. The payload customer and payload engineer will enter this information.

Data Categories	Description
Payload Definition	Data associated with a specific payload (e.g., payload identification and payload contact).
Basic Parameter Definition	MSID related data common across multiple data groups (e.g., nomenclature and data type).
Calibration	Calibration requirements for: • Measurement Calibration Data • Analog Onboard Command Calibration Data
MDM Channelization	Channelization requirements for: • Hardware Measurement Channelization • Flight Software Channelization Data • Onboard GPC Discrete Data • Uplink Real-Time Commands
Command Command Data Word	Command requirements for: • Basic Command Data • Onboard GPC Discrete Data • Onboard Stored Serial Commands • Uplink Real-Time Commands • Uplink Load Commands
Downlist	Downlist requirements for: • Downlist Format Requirements Hardware Measurements • Downlist Format Requirements Flight Software Measurements
FDA	Fault Detection & Annunciation requirements for: • Critical Hardware and Flight Software Parameters • Alert Hardware and Flight Software Parameters
FDA Preconditioning	Fault Detection & Annunciation requirements for: • Precondition Steering Hardware Parameters • Precondition Steering Flight Software Parameters
MRTC	Multiple Real-Time (MRTC) Command requirements
Payload Data Stream Structure	PDI Format Data requirements for: • Telemetry Independent Format data • Payload Reconstructed Format data
PSP Message	Payload Signal Processor Integration (PSP) command and telemetry requirements
SSI Definition	Standard Serial Interface (SSI) definition requirements
Decom Words Downlinked	Telemetry Decommutation Pairs Data
Telemetry Parameter Location Definition	Telemetry Decommutation Data requirements and loading information

This use case additionally allows the actor to generate Annex 4 Table reports in Rich Text Format (RTF) [5]. Implementations of some reports are not required at this time. These reports instead of being populated with data will contain a banner stating NOT REQUIRED. The following Annex 4 reports are provided:

Table	Data Groupings
Table 1	Basic Hardware Measurement Data (MSID) Basic Hardware Measurement Data (Customer Item)
Table 2	Hardware Measurement Channelization Data
Table 3	Measurement Calibration Data
Table 4	Downlist Format Requirements Hardware Measurements

Table	Data Groupings
Table 5	Telemetry Decommutation Data (MSID)
	Telemetry Decommutation Data (Customer Item)
Table 6	Telemetry Decommutation Data Format xx (NOT REQUIRED - BANNER PAGE ONLY)
Table 7	PDI Format Data
	Payload Reconstructed Format Data
	Telemetry Independent Format Data
	Customer Format Data
Table 8	Fault Detection & Annunciation (Critical) Hardware Parameters
Table 9	Fault Detection & Annunciation (Alert) Hardware Parameters
Table 10	Fault Detection & Annunciation (Precondition Steering) Hardware Parameters (NOT REQUIRED - BANNER PAGE ONLY)
Table 11	Basic Command Data (NASA)
	Basic Command Data (Customer Item)
Table 12	Onboard GPC Discrete Data (NOT REQUIRED - BANNER PAGE ONLY)
Table 13	Onboard Stored Serial Commands (NOT REQUIRED - BANNER PAGE ONLY)
Table 14	Uplink Real-Time Commands
Table 15	Uplink Load Commands
Table 16	Multiple Real-Time Commands (NOT REQUIRED - BANNER PAGE ONLY)
Table 17	Analog Onboard Command Calibration Data (NOT REQUIRED - BANNER PAGE ONLY)
Table 18	Standard Serial Interface Description Data
Table 19	Payload Signal Processor Integration Data
Table 20	Payload Applications (TLM)
	Payload Applications (CMD)
Table 21	Payload Applications - GPCF Commands
	Payload Applications - GPCF PLD Data Monitor
Table 22	Payload Selected Standard Orbiter Parameters

2. Pre-Conditions

The following pre-conditions must be present prior to 'Generate Product – Payload XML' use case can be performed. If the user selects to generate a sub-set of the total products, certain pre-conditions are not required. This use case is written to cover any or all of the product generation.

2.1 Authenticate User

Before this use case begins the user has logged onto the POST system and has been authorized to work on command and data information for a set of payloads. The user is presented with a POST menu containing options based on the users authority.

2.2 CDT-01A Enter Payload Information (Define Basic Payload Information) Use Case complete

The user has already entered the Basic Payload information.

2.3 CDT-01B Enter Payload Information (Define Payload Interfaces) Use Case complete

The user has already defined the payload interfaces.

2.4 CDT-01C Enter Payload Information (Define Telemetry Structures) Use Case complete

The user has already defined some Telemetry structure data.

2.5 CDT-01E Enter Payload Information (Define Serial Telemetry PDI) Use Case complete

The user has already defined some Serial Telemetry parameter data.

2.6 CDT-01F - I Enter Payload Information (Define Telemetry) Use Cases complete

The user has already defined some MDM Telemetry parameter data.

2.7 CDT-01J - N Enter Payload Information (Define Commands) Use Cases complete

The user has already defined some MDM Command parameter data.

2.8 CDT-01O Services Payload Application Definition Use Case complete

The user has defined one or more payload application(s).

3. Use Case Overview

This use case begins when the user requests to generate a binary, RTF and/or XML product produced by the CDT. The user selects the specific product(s) to be generated. The CDT will audit the data required to generate the product, providing an audit status. The CDT will extract the data required from the data repository and format the product. The requested product(s) are then stored in a user specified directory location as individual file(s) and/or combined into a JAR file.

4. Flow of Events

4.1 Basic Flow

1. The user selects "Generate Products | Payload Test Support" from the POST Main form. [A-1 Configuration Control Product Generation]

2. The system responds by invoking a server side program to extract the current list of Payload Applications and then displays the form Generate Products - Payload Test Support (FGenerateProductsPayloadTestSupport).

3. The user selects one or more products from the form.

4. The user optionally selects "Audit Payload Data" checkbox from the form.

5. The user enters a valid "Local File System Directory" [A-2 - Local File System Directory Browse Requested]

6. The user selects one or more of the "Retrieve Selected Product Files As:" check boxes (JAR file and/or separate files).

7. The user selects "Generate Product". [E1]

8. The system responds by invoking server side program(s) to

   a) Perform an audit on the data required for the products, if the forms "Audit Payload Data" is selected [E2]

   b) Generate the form selected RTF, XML and GPCF Binary products [E2] For the Annex 4 Reports, if the user selected "ALL REPORTS", only the combined report will be generated – no individual reports. In all cases, the combined report includes all of the user requested Annex 4 Reports.

9. Based on the forms "Retrieve Selected Product Files As" selection(s), the system saves the selected product(s) and/or JAR file containing the selected product(s) to the drive/path defined in the "Local File System Directory" form field. [E3]

10. The system presents an information dialog providing result status of the form selection(s) requested - audit and/or Product Generation.

11. The user closes the information dialog.

4.2 Alternative Flows

4.2.1 Alternate Flow A-1 – Configuration Control Product Generation

1. The user selects "Generate Products | Configuration Management" from the POST Main form.

2. The system responds by invoking a server side program to extract the current list of Payload Applications and then displays the form Generate Products – Configuration Control (FGenerateProductsConfigurationControl). The form presents all the products to be generated. The products will be built and available for export through SDR.

3. The user enters a valid "Local File System Directory" [A-2 - Local File System Directory Browse Requested]

4. The user selects "Generate Product". [E1]

5. The system responds by invoking server side program(s) to

   a) Perform an audit on the data required for the products [E2]

   b) Generate the RTF, XML and GPCF Binary [6] products [E2] (Note: The RTF product will only consist of a single combined report containing all the Annex 4 Tables.)

   c) Save the generated produces in a JAR file placed at the selected directory defined in the "Local File System Directory" text area. [E3]

6. The system presents an information dialog providing result status of the audit and product generation.

7. The user closes the information dialog.

8. Use Case ends.

4.2.2 Alternate Flow A-2 - Local File System Directory Browse Requested

1. User selects "Browse" button to identify the product output location on the local file system.

2. The user selects the directory from the "Browse" form.

3. The system presents a directory selection dialog for the user to identify the location of the product output.

4. The user selects the directory location.

5. The system places the selected directory in the "Local File System Directory" text area.

6. Return back to flow.

4.3 Exception Flows

4.3.1 Exception Flow E1 - Required inputs not selected

The system will display an error message identifying that the required inputs have not been supplied.

4.3.2 Exception Flow E2 - Access problems while accessing data repository

The system will display an error message identifying that the data repository had connection problems while generating the product.

4.3.3 Exception Flow E3 - Access problems while saving to drive

The system will display an error message identifying a failed attempt at saving products to the form's defined drive/path.

5. Extension Points

N/A

6. Post-Conditions

6.1 Human-visible post-conditions

N/A

6.2 Internal post-conditions

N/A

7. Non-Functional / Special Requirements

N/A

8. Data Dictionary

See POST Command and Data Tool Data Dictionary in References section of this document.

9. References

1. CR 92318 - Space Shuttle Computer Program Development Specifications (CPDS) SS-P-0002-170 SFOC-PASS0052
2. Standard Integration Plan Annex No. 4 - Command And Data Requirements - NSTS 21000-A04
3. POST Command and Data Tool Data Dictionary
4. Payload Operations Support Team (POST) Command and Data Tool (CDT) Product Interface Definition Document (IDD) - USA003065
5. POST Command and Data Tool Product Definitions: Annex No. 4 – Command and Data Requirements Tables
6. POST Tools Use Case Specification: CDT-07A Generate Product - GPCF